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ABSTRACT

A study was conducted at John C. Calhoun State Community College (JCSCC), in Alabama, to determine whether there is a significant difference between the grade distribution in sections taught using the telecourse format and in sections taught by the same instructor in the same term, but utilizing traditional classroom format. Data for courses were collected from JCSCC's college course database, and were compared by figuring an average grade point average (GPA) for each section. There were 604 students enrolled in the 18 telecourse sections used in the study, and 368 students enrolled in the 18 regular sections. The study indicated no significant differences in average GPA's between telecourse (2.64) and traditional (2.86) formats. The range for GPA's for traditional sections was 1.47 (2.26 to 3.73), and the range for the telecourse sections was 2.29 (1.71 to 4.00). However, the results indicated that student completion rates might be higher in the traditional sections than in the telecourse sections, suggesting the need for additional research on student withdrawal in order to identify opportunities for improving the completion rate for telecourse students. Nineteen charts are presented representing the grade distribution and average GPA for each course, along with comparative information on numbers of students in the two sections. (MAB)

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ED 362 251

GRADE DISTRIBUTION STUDY

TELECOURSES vs. TRADITIONAL COURSES

A study to determine whether there is a significant difference in the grade distributions in sections of courses taught in the telecourse format compared to the grade distributions in sections of the same courses taught by the same instructor during the same term but in the traditional instructional format

For the Calhoun Telecourse Steering Committee, Chris Hamilton, Chair

Data analysis and reporting, Robert D. Searcy, Institutional Research
Narrative editor, Clement Howton, Institutional Development
Statistics editor, Mary Yarbrough, Statistics Instructor

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JC 930 478

GRADE DISTRIBUTION

TELECOURSES vs. TRADITIONAL COURSES

Introduction:

This study was initiated by Chris Hamilton, Associate Dean of Instruction of Calhoun Community College. Mrs. Hamilton chairs the Telecourse Steering Committee for the college, and she expressed the need to know whether there is a significant difference in

> grade distributions when comparing the grades awarded in sections of courses taught in the telecourse format to the grades awarded in separate sections of the same courses that are taught in the traditional classroom format. Therefore, the null hypothesis is that there is no significant difference in the average, grade-point-average for courses taught in the telecourse format and those taught in the traditional format.

The study was initiated solely as the first step in the process of collecting information helpful to the Calhoun Telecourse Steering Committee in its deliberations about relevant instructional policies and procedures expressly for telecourses.

Purpose:

The purpose of this study is to determine whether there is a significant difference in the grade distributions in sections of courses taught in the telecourse instructional format compared to the grade distributions in sections of the same courses taught by the same instructor during the same term but in the "regular or traditional" classroom instructional format.

Method:

The request that this study be conducted came to the Office of Institutional Research in September, 1993, and was in the form of a memorandum with an attachment identifying telecourses taught at the college since the Spring Term of 1992. Data related to telecourses were collected using the college course database, with assistance from the college Computer Services Center. Assistance with statistical interpretation was provided by Dr. Mary Yarbrough, statistics instructor at the college.

Data were loaded into a Microsoft Excel spreadsheet, manipulated, and charted. Charts were copied and pasted into a Microsoft Word for Windows file.

Grades awarded to students in sections of courses taught in the telecourse instructional format were compared to the grades awarded to students in sections of the same courses, taught during the same quarter, by the same instructors but in the regular or traditional instructional format. The "average, grade-point-average" was calculated for each section of each course used in the study. The average, grade-point-average for each course was used to calculate the Student's *t* Test for small samples in testing the null hypothesis.

The average, grade-point-average for each section as used in this study was defined as the mean of the grades awarded by one instructor, in one course section, during one term. Grades and quality points used in this study and included in the calculation of average, grade-point-average were as follows: A = 4 points; B = 3 points; C = 2 points; D = 1 point; F = 0 points.

Grades of "W" and "I" were not used in the calculations of average, grade-point-average. To maintain data integrity, sections of courses were included in the study only when an instructor taught two sections of one course; one section in the telecourse format and the other section in the traditional format and during the same term. Instructor and course information are coded to provide appropriate and complete instructor and student anonymity.

Presentation of Data:

The average, grade-point-averages for instructors teaching telecourse sections are designated in the following data as GPA x1, and the average, grade-point-averages for that instructors teaching didactic sections of the same course are designated as GPA x2 (Table 1). The .05 level of significance was selected. Use of the *F* distribution statistic indicated that the two samples had equal variances. Therefore, the Student's *t* Test for two samples--assuming equal variances--was used.

Based on the Student's *t* Test for two samples--assuming equal variances--there was no significant difference between the average, grade-point-averages in telecourses compared to the average, grade-point-averages in didactic courses. (H_0: GPA x1 = GPA x2. The calculated $t = 1.3609$. The critical value of $t = 2.0322$ (See data, this page). Therefore, the null hypothesis was accepted, and it was concluded that there was no significant difference between GPA x1 and GPA x2. This means that we have failed to prove that there was a significant difference between the average, grade-point-average for telecourses and the corresponding didactic courses (See Table 1).

Table 1

X1 GPA x1	X2 GPA x2
4	3.73
2.86	2.83
3.55	3.14
2.30	2.70
2.14	2.35
1.92	3.19
3.13	3.27
2.37	2.78
2.74	2.64
2.95	3.27
1.71	2.26
2.33	2.77
2.19	2.68
2.21	2.26
2.83	3.34
2.76	2.72
2.80	2.93
2.67	2.60

t-Test: Two-Sample Assuming Equal Variances	*GPA x1*	*GPA x2*
Mean	2.6367	2.8589
Variance	0.3208	0.1591
Observations	18.0000	18.0000
Pooled Variance	0.2400	
Hypothesized Mean Difference	0.0000	
df	34.0000	
t	-1.3609	
P(T<=t) one-tail	0.0912	
t Critical one-tail	1.6909	
P(T<=t) two-tail	0.1825	
t Critical two-tail	2.0322	

There were 604 students enrolled in sections of telecourses used in this study. Likewise, there were 368 students enrolled in different sections of traditional courses taught in the traditional format and used in this study. There were 18 sections of telecourses and 18 sections of traditional courses that matched the parameters of this study. The mean grade-point-average for telecourses was 2.64. The mean grade-point-average for the corresponding traditional courses was 2.86. The Student's *t* Test indicated no significant difference in the average, grade-point-average for these courses.

The range for the average, grade-point-average for the traditionally taught course sections was 1.47 with a minimum of 2.26 and a maximum of 3.73. The range for the average, grade-point-average for telecourses was 2.29 with a minimum of 1.71 and a maximum of 4.00. The summary of percentages for grades awarded in the various categories of A, B, C, D, F, W, and I for courses in the telecourse format and the traditional format appeared as follows:

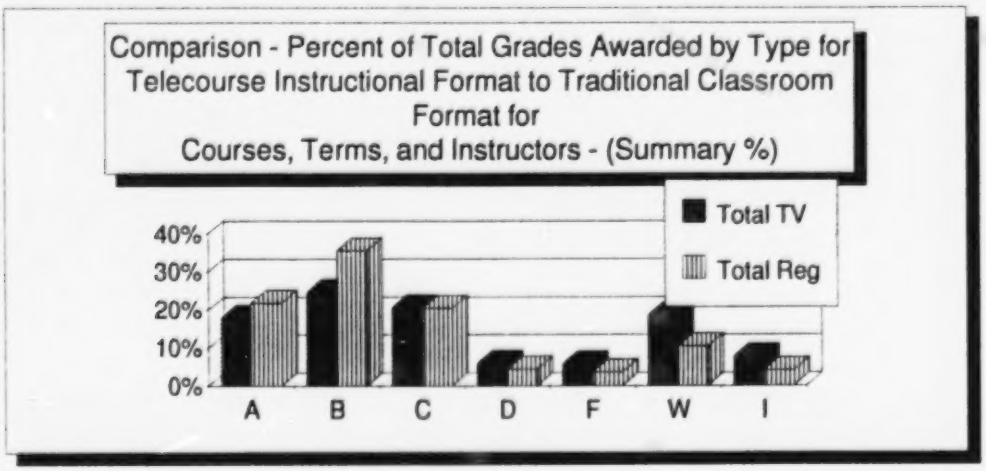
The telecourse format had . . .

A = 18%; B = 25%; C = 20%; D = 06%; F = 06%; W = 18%, and I = 08%;

. . . and for the traditional course:

A = 22%; B = 36%; C = 20%; D = 04%; F = 04%; W = 10%, and I = 04%. (See Chart 1).

Chart 1



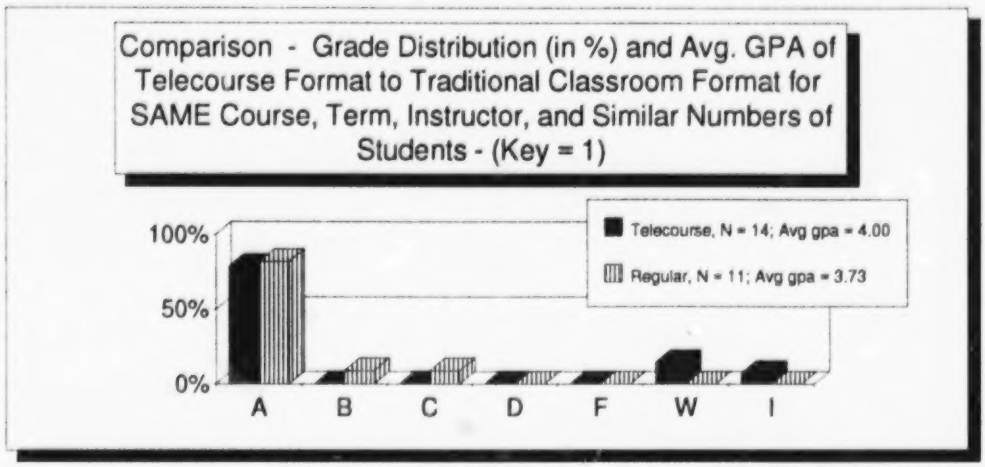
Each chart presented on the following pages represents the grades awarded for two sections of one course. The grades awarded for the section of the course taught in the telecourse format are presented in percentages in columns 1, 3, 5, 7, 9, and 11 and reflect the award of grades of A, B, C, D, F, W, and I, respectively. The grades awarded for the section of the same course but taught in the traditional classroom format are presented in percentages in columns 2, 4, 6, 8, 10, and 12 and represent the award of grades of A, B, C, D, F, W, and I, respectively. Grades of "W" and "I" were excluded in the calculation of the "average, grade-point-average."

Key 1; Chart 2:

The grade distribution, in percents, for the telecourse section was as follows:
A = 79%; B = 00%; C = 00%; D = 00%; F = 00%; W = 14%, and I = 07%; and for the traditional course:
A = 82%; B = 09%; C = 09%; D = 00%; F = 00%; W = 00%, and I = 00%.

The average, grade-point-average for the telecourse format was 4.00.
The average, grade-point-average for the traditional course was 3.73. See Chart 2.

Chart 2

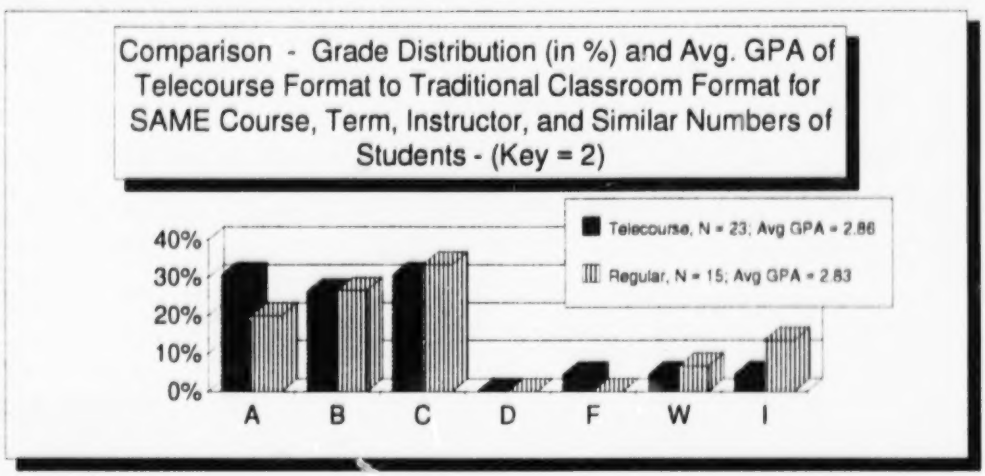

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Similar Numbers of Students - (Key = 1)
Telecourse, N = 14; Avg gpa = 4.00
Regular, N = 11; Avg gpa = 3.73
100%
50%
0%
A
B
C
D
F
W
I

Key 2; Chart 3:

The grade distribution, in percents, for the telecourse section was as follows:
A = 30%; B = 26%; C = 30%; D = 00%; F = 04%; W = 04%, and I = 04%; and for the traditional course:
A = 20%; B = 27%; C = 33%; D = 00%; F = 00%; W = 07%, and I = 13%.

The average, grade-point-average for the telecourse format was 2.86.
The average, grade-point-average for the traditional course was 2.83. See Chart 3.

Chart 3

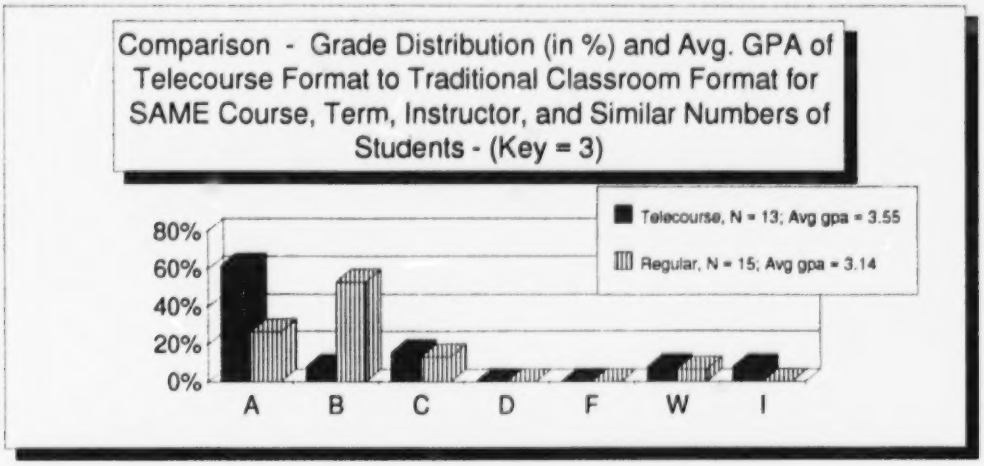


Key 3; Chart 4:

The grade distribution, in percents, for the telecourse section was as follows:
A = 62%; B = 08%; C = 15%; D = 00%; F = 00%; W = 08%, and I = 08%; and for the traditional course:
A = 27%; B = 53%; C = 13%; D = 00%; F = 00%; W = 07%, and I = 00%.

The average, grade-point-average for the telecourse format was 3.55.
The average, grade-point-average for the traditional course was 3.14. See Chart 4.

Chart 4

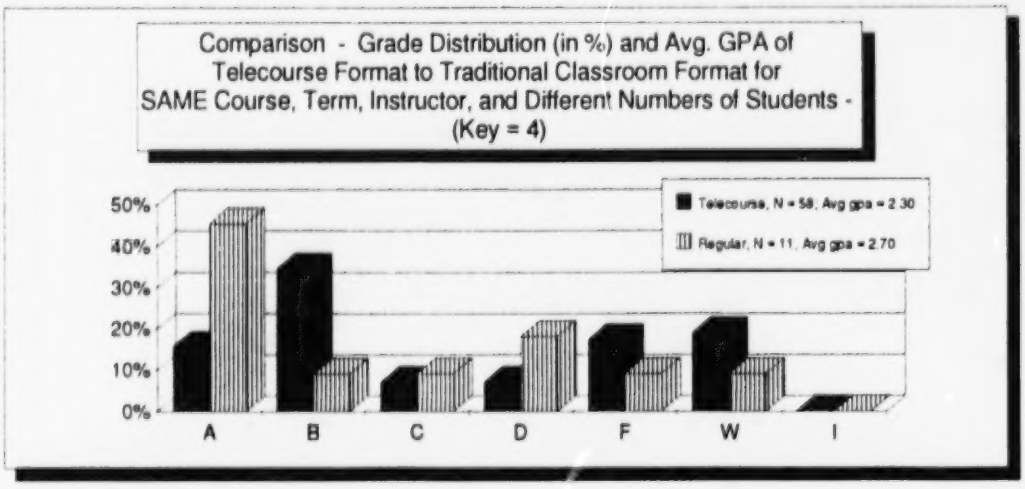


Key 4; Chart 5:

The grade distribution, in percents, for the telecourse section was as follows:
A = 16%; B = 34%; C = 07%; D = 07%; F = 17%; W = 19%, and I = 00%; and for the traditional course:
A = 45%; B = 09%; C = 09%; D = 18%; F = 09%; W = 09%, and I = 00%.

The average, grade-point-average for the telecourse format was 2.30.
The average, grade-point-average for the traditional course was 2.70. See Chart 5.

Chart 5

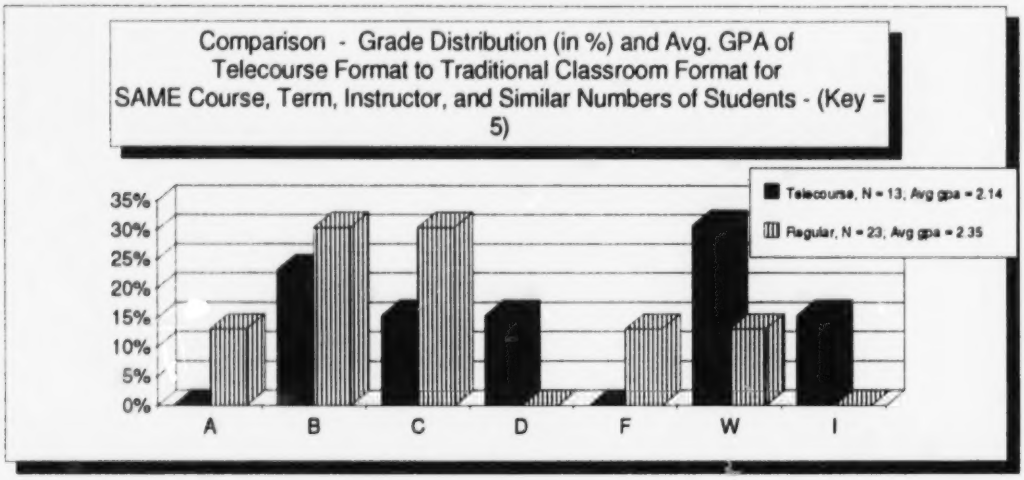


Key 5; Chart 6:

The grade distribution, in percents, for the telecourse section was as follows:
A = 00%; B = 23%; C = 15%; D = 15%; F = 00%; W = 31%, and I = 15%; and for the traditional course:
A = 13%; B = 30%; C = 30%; D = 00%; F = 13%; W = 13%, and I = 00%.

The average, grade-point-average for the telecourse format was 2.14.
The average, grade-point-average for the traditional course was 2.35. See Chart 6.

Chart 6

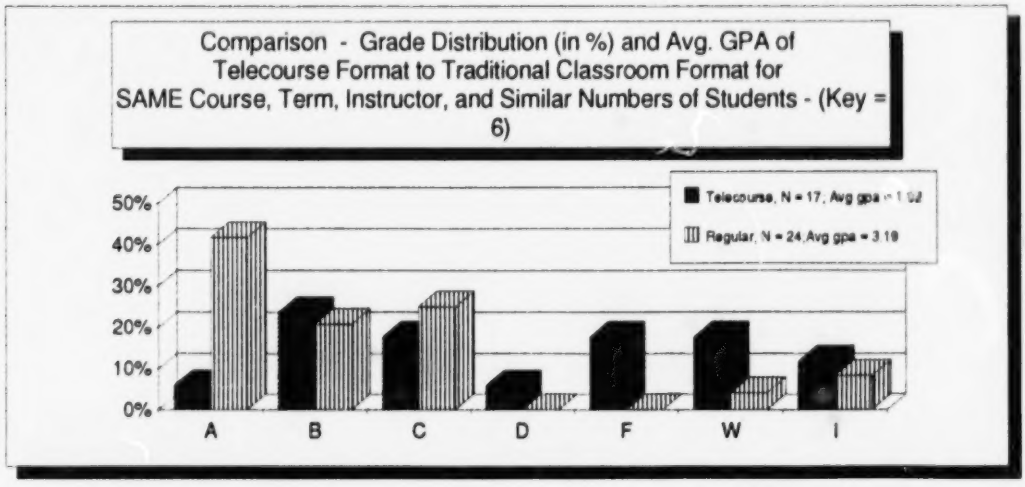


Key 6; Chart 7:

The grade distribution, in percents, for the telecourse section was as follows:
A = 06%; B = 24%; C = 18%; D = 06%; F = 18%; W = 18%, and I = 12%; and for the traditional course:
A = 42%; B = 21%; C = 25%; D = 00%; F = 00%; W = 04%, and I = 08%.

The average, grade-point-average for the telecourse section was 1.92.
The average, grade-point-average for the traditional section was 3.19. See Chart 7.

Chart 7

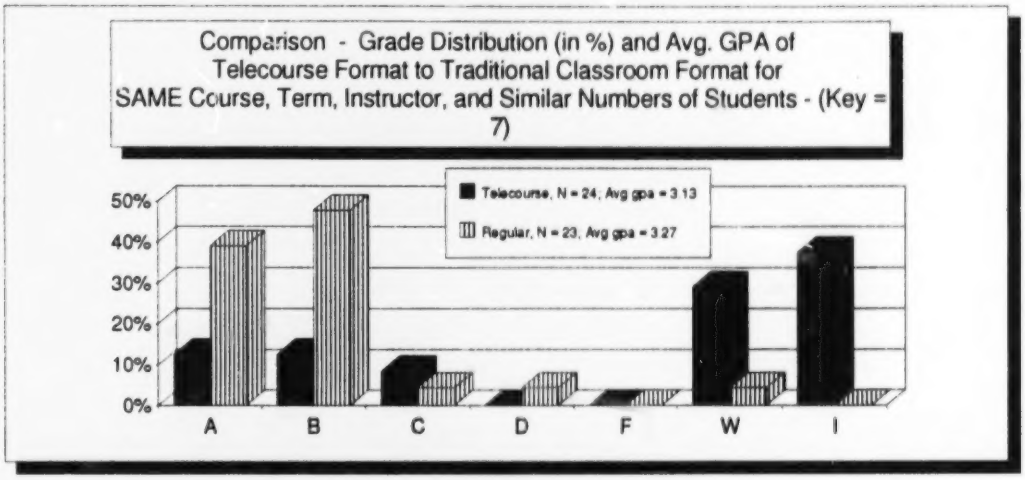


Key 7; Chart 8:

The grade distribution, in percents, for the telecourse section was as follows:
A = 13%; B = 13%; C = 08%; D = 00%; F = 00%; W = 29%, and I = 38%; and for the traditional course:
A = 39%; B = 48%; C = 04%; D = 04%; F = 00%; W = 04%, and I = 00%.

The average, grade-point-average for the telecourse section was 3.13.
The average, grade-point-average for the traditional section was 3.27. See Chart 8.

Chart 8

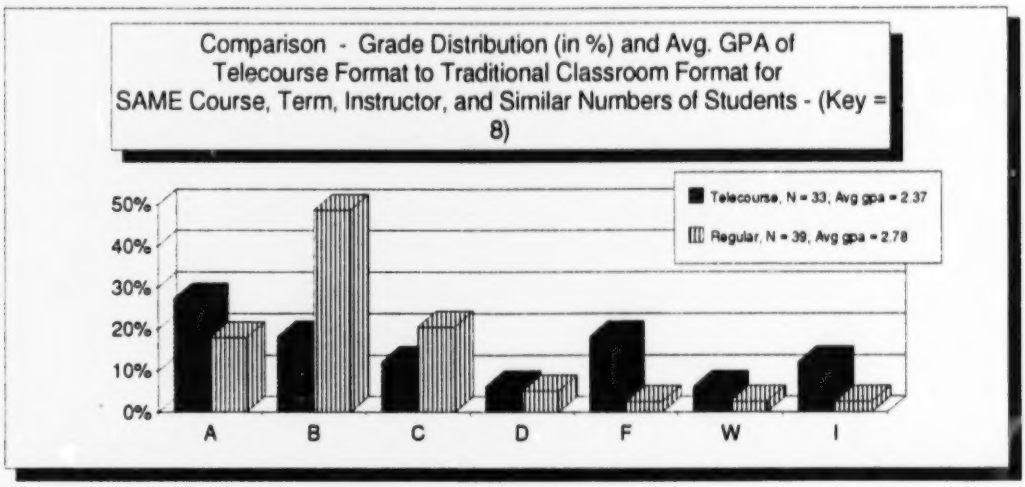


Key 8; Chart 9:

The grade distribution, in percents, for the telecourse section was as follows:
A = 27%; B = 18%; C = 12%; D = 06%; F = 18%; W = 06%, and I = 12%; and for the traditional course:
A = 18%; B = 49%; C = 21%; D = 05%; F = 03%; W = 03%, and I = 03%.

The average, grade-point-average for the telecourse section was 2.37.
The average, grade-point-average for the traditional section was 2.78. See Chart 9.

Chart 9

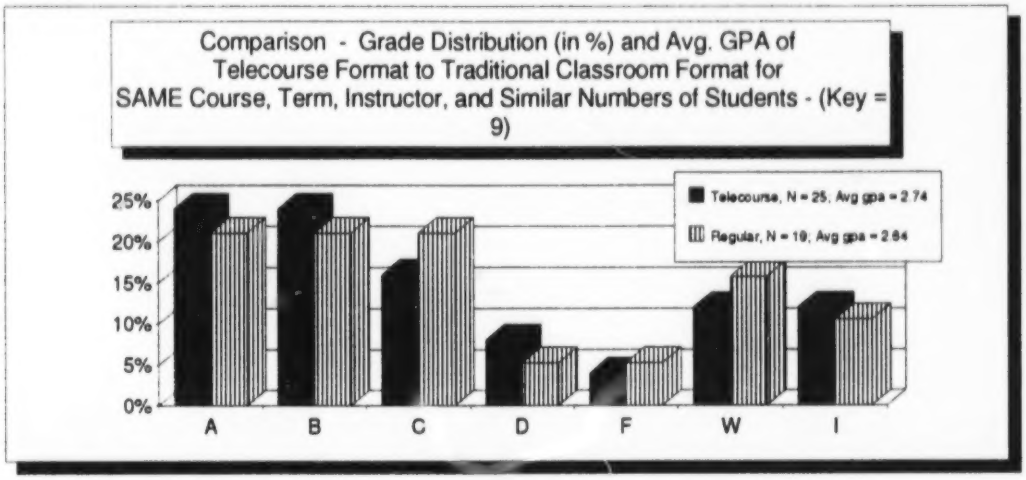


Key 9; Chart 10:

The grade distribution, in percents, for the telecourse section was as follows:
A = 24%; B = 24%; C = 16%; D = 08%; F = 04%; W = 12%, and I = 12%; and for the traditional course:
A = 21%; B = 21%; C = 21%; D = 05%; F = 05%; W = 16%, and I = 11%.

The average, grade-point-average for the telecourse section was 2.74.
The average, grade-point-average for the traditional section was 2.64. See Chart 10.

Chart 10

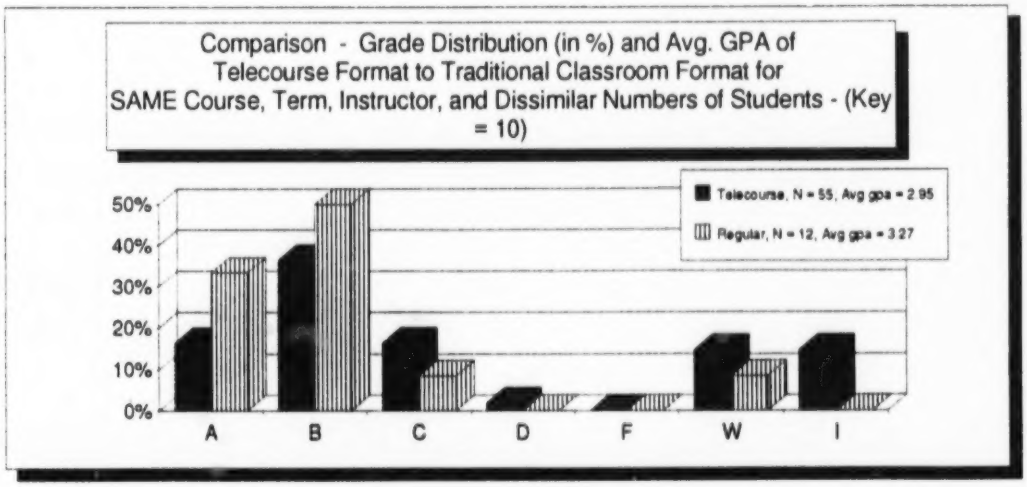


Key 10; Chart 11:

The grade distribution, in percents, for the telecourse section was as follows:
A = 16%; B = 36%; C = 16%; D = 02%; F = 00%; W = 15%, and I = 15%; and for the traditional course:
A = 33%; B = 50%; C = 08%; D = 00%; F = 00%; W = 08%, and I = 00%.

The average, grade-point-average for the telecourse section was 2.95.
The average, grade-point-average for the traditional section was 3.27. See Chart 11.

Chart 11

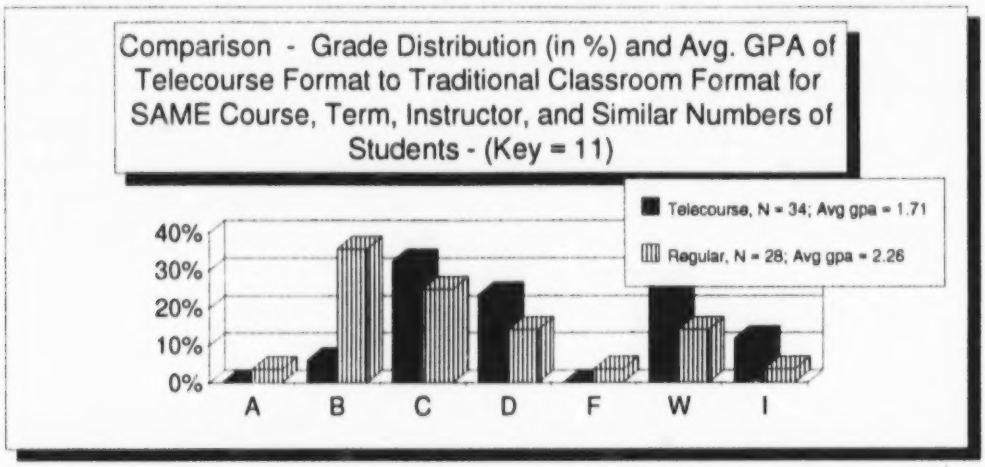


Key 11; Chart 12:

The grade distribution, in percents, for the telecourse section was as follows:
A = 00%; B = 06%; C = 32%; D = 24%; F = 00%; W = 26%, and I = 12%; and for the traditional course:
A = 04%; B = 36%; C = 25%; D = 14%; F = 04%; W = 14%, and I = 04%.

The average, grade-point-average for the telecourse section was 1.71.
The average, grade-point-average for the traditional section was 2.26. See Chart 12.

Chart 12

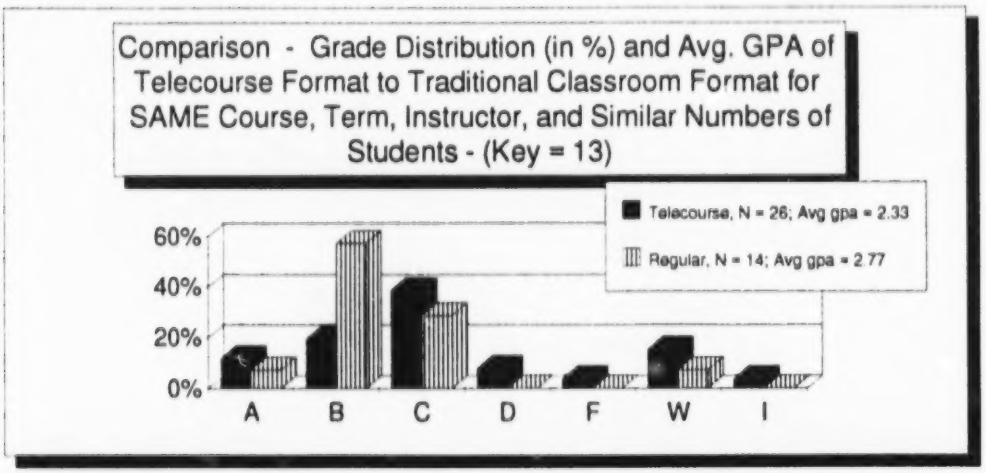


Key 13; Chart 13:

The grade distribution, in percents, for the telecourse section was as follows:
A = 12%; B = 19%; C = 38%; D = 08%; F = 04%; W = 15%, and I = 04%; and for the traditional course:
A = 07%; B = 57%; C = 29%; D = 00%; F = 00%; W = 07%, and I = 00%.

The average, grade-point-average for the telecourse section was 2.33.
The average, grade-point-average for the traditional section was 2.77. See Chart 13.

Chart 13

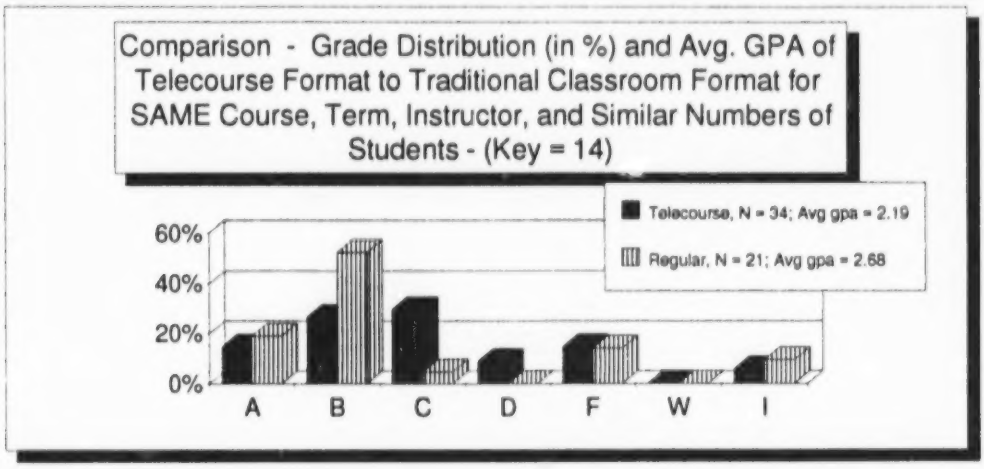

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Similar Numbers of Students - (Key = 13)
Telecourse, N = 26; Avg gpa = 2.33
Regular, N = 14; Avg gpa = 2.77
60%
40%
20%
0%
A
B
C
D
F
W
I

Key 14; Chart 14:

The grade distribution, in percents, for the telecourse section was as follows:
A = 15%; B = 26%; C = 29%; D = 09%; F = 15%; W = 00%, and I = 06%; and for the traditional course:
A = 19%; B = 52%; C = 05%; D = 00%; F = 14%; W = 00%, and I = 10%.

The average, grade-point-average for the telecourse section was 2.19.
The average, grade-point-average for the traditional section was 2.68. See Chart 14.

Chart 14

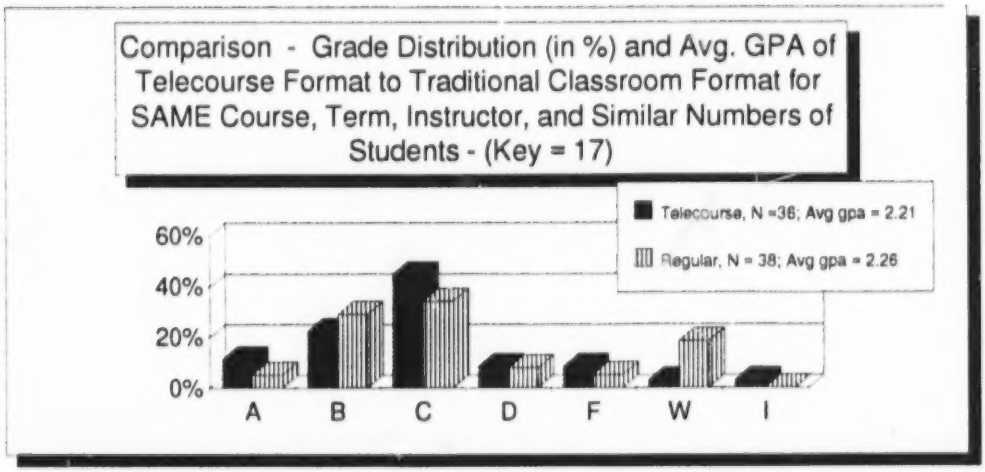

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Similar Numbers of Students - (Key = 14)
Telecourse, N = 34; Avg gpa = 2.19
Regular, N = 21; Avg gpa = 2.68
60%
40%
20%
0%
A
B
C
D
F
W
I

Key 17; Chart 15:

The grade distribution, in percents, for the telecourse section was as follows:
A = 11%; B = 22%; C = 44%; D = 08%; F = 08%; W = 03%, and I = 03%; and for the traditional course:
A = 05%; B = 29%; C = 34%; D = 08%; F = 05%; W = 18%, and I = 00%.

The average, grade-point-average for the telecourse section was 2.21.
The average, grade-point-average for the traditional section was 2.26. See Chart 15.

Chart 15

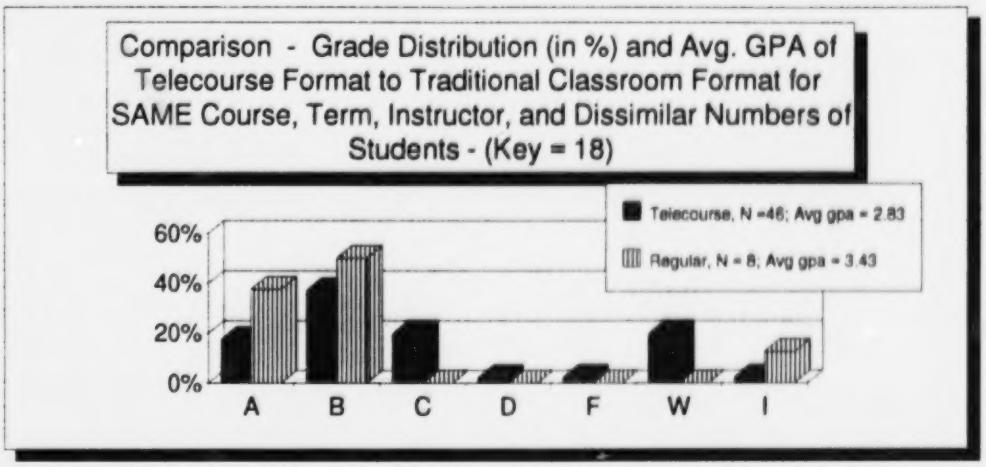

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Similar Numbers of Students - (Key = 17)
Telecourse, N =36; Avg gpa = 2.21
Regular, N = 38; Avg gpa = 2.26
60%
40%
20%
0%
A
B
C
D
F
W
I

Key 18; Chart 16:

The grade distribution, in percents, for the telecourse section was as follows: A = 17%; B = 37%; C = 20%; D = 08%; F = 02%; W = 20%, and I = 02%; and for the traditional course: A = 38%; B = 50%; C = 00%; D = 00%; F = 00%; W = 00%, and I = 13%.

The average, grade-point-average for the telecourse section was 2.83.
The average, grade-point-average for the traditional section was 3.43. See Chart 16.

Chart 16

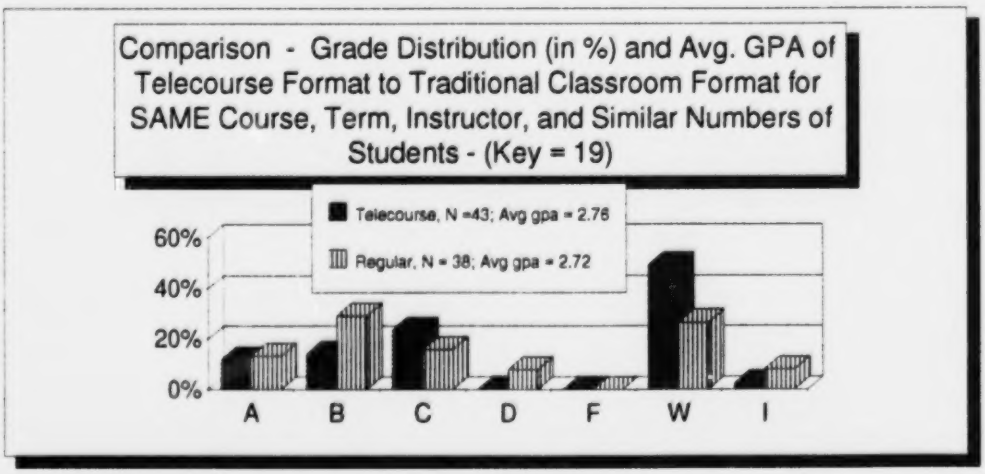

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Dissimilar Numbers of Students - (Key = 18)
Telecourse, N =46; Avg gpa = 2.83
Regular, N = 8; Avg gpa = 3.43
60%
40%
20%
0%
A
B
C
D
F
W
I

Key 19; Chart 17:

The grade distribution, in percents, for the telecourse section was as follows: A = 12%; B = 14%; C = 23%; D = 00%; F = 00%; W = 48%, and I = 02%; and for the traditional course: A = 13%; B = 29%; C = 16%; D = 08%; F = 00%; W = 26%, and I = 08%.

The average, grade-point-average for the telecourse section was 2.76.
The average, grade-point-average for the traditional section was 2.72. See Chart 17.

Chart 17

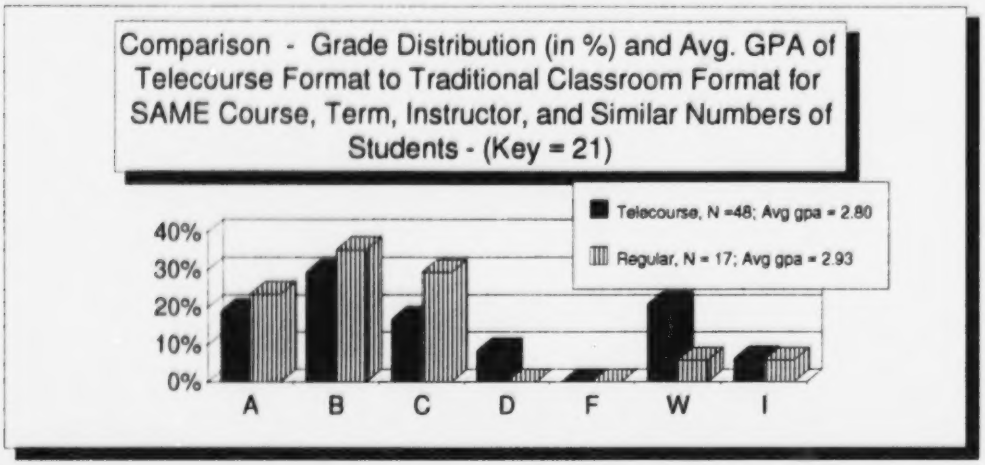

Comparison - Grade Distribution (in %) and Avg. GPA of Telecourse Format to Traditional Classroom Format for SAME Course, Term, Instructor, and Similar Numbers of Students - (Key = 19)
Telecourse, N =43; Avg gpa = 2.76
Regular, N = 38; Avg gpa = 2.72
60%
40%
20%
0%
A
B
C
D
F
W
I

Key 21; Chart 18:

The grade distribution, in percents, for the telecourse section was as follows:
A = 19%; B = 29%; C = 17%; D = 08%; F = 00%; W = 21%, and I = 06%; and for the traditional course:
A = 24%; B = 35%; C = 29%; D = 00%; F = 00%; W = 06%, and I = 06%.

The average, grade-point-average for the telecourse section was 2.80.
The average, grade-point-average for the traditional section was 2.93. See Chart 18.

Chart 18

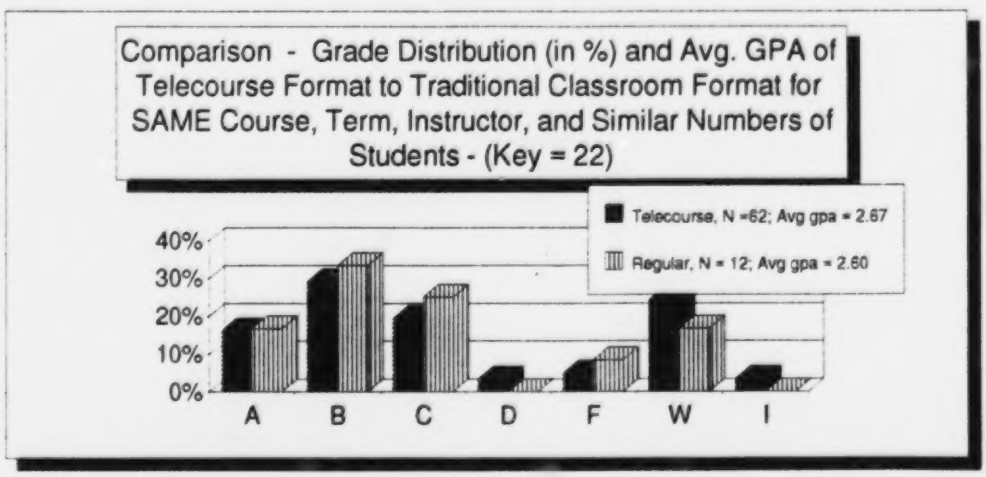


Key 22; Chart 19:

The grade distribution, in percents, for the telecourse section was as follows:
A = 16%; B = 18%; C = 12%; D = 02%; F = 03%; W = 15%, and I = 02%; and for the traditional course:
A = 17%; B = 33%; C = 25%; D = 00%; F = 08%; W = 17%, and I = 00%.

The average, grade-point-average for the telecourse section was 2.67.
The average, grade-point-average for the traditional section was 2.60. See Chart 18.

Chart 19



Summary:

The purpose of this study was to determine whether there was a significant difference in the grade distributions of courses delivered in the telecourse format and the grade distributions of courses delivered in the traditional format. Grade distributions for all courses included in this study were converted to an average, grade-point-average. The average, grade-point-average for each course was used in calculating the Student's *t* statistic. Based on the Student's *t* Test for two samples--assuming equal variances, it was found that there was no significant difference in the average, grade-point-averages in telecourses and the average, grade-point-averages in traditional courses for cases used in this study.

Recommendations:

Additional study is recommended. For example, the graphically represented data in the separate charts seems to indicate that student completion rates may be higher in the sections of courses taught in the traditional instructional format when compared to sections of courses taught in the telecourse format. For example, the student withdrawal rate for telecourses might be studied. Additional study of withdrawals could identify opportunities for improving the completion rate of students in telecourses.